



Montana
Office of Public Instruction
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Science Model Teaching Unit

Smallpox Epidemic

Created by Shirley Greene

Grades 6 and 7 - Approximate Duration: 50 minutes

Stage 1 Desired Results

Established Goals

Science Content Standard 3: Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

Essential Understanding 1: There is a great diversity among the 12 tribal Nations of Montana in their languages, cultures, histories and governments. Each Nation has a distinct and unique cultural heritage that contributes to modern Montana.

Essential Understanding 6: History is a story most often related through the subjective experience of the teller. With the inclusion of more and varied voices, histories are being rediscovered and revised. History told from an Indian perspective frequently conflicts with the stories mainstream historians tell.

Understandings

- Smallpox is a disease, which has not infected any humans since 1977.
- Smallpox is a disease caused by a virus.
- American Indians experienced a high mortality rate due to Smallpox.
- Smallpox has changed human history.

Essential Questions

- What are the symptoms of smallpox?
- What is the treatment of smallpox?
- What happened when an American Indian village became infected with smallpox?
- How did the smallpox epidemics affect American Indian cultures?

Students will be able to...

- determine the rate of possible deaths in an American Indian population infected with smallpox.
- determine the percentage of actual deaths.
- explain how having many people die in a village or tribe would affect the tribe members left behind.

Students will know...

- smallpox is a disease caused by a virus.
- smallpox has been eradicated
- smallpox and other diseases have changed human history.

Stage 2 Assessment Evidence

Performance Tasks

Students will be assessed through engagement in a classroom discussion, responding to critical thinking questions, and mathematical calculations of a smallpox infection in a simulation.

Other Evidence

Students will be questioned individually.



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Stage 3 Learning Plan

1. Review what students know about smallpox.
2. Distribute the **Smallpox Worksheet** and have them complete #1-2 of the worksheet throughout the class discussion.
3. Show students a picture of a person suffering from smallpox (<http://science.nationalgeographic.com/science/enlarge/smallpox-virus.html>)
4. Discuss smallpox and its history.
5. Discuss “bottleneck” theory: people who survive epidemics might have a natural, genetic immunity to the disease and pass this on to their children. Populations which have been exposed to a particular disease over hundreds of years might not have as high a mortality rate as populations which have never been exposed.
6. Show a world globe/map to the students. What might have kept smallpox out of North and South America? (oceans) What might you expect to happen to populations that are exposed to smallpox for the first time? (high mortality) Why? (no immunity, no knowledge of disease)
7. What was one way Native peoples of North America became exposed to smallpox? Have students work, in pairs, through http://www.umass.edu/legal/derrico/amherst/lord_jeff.html. Instruct students to pay special attention to the sections beginning with “Smallpox blankets”. Students should complete # 3 – 7, of the **Smallpox Worksheet** as they work in pairs.
8. Distribute information from the Centers for Disease Control and Prevention website, <http://emergency.cdc.gov/agent/smallpox/overview/disease-facts.asp>, or have students read the information from the website themselves. It may be good to have them do it individually, in pairs, or projected as a class.
9. Tell students that they are going to have a simulation of smallpox infecting the class. They are all going to be exposed to smallpox. Some will survive, and some will die.
10. Show container with cards inside it to students. Instruct them that they are to come up, choose one card, look at both sides, place the card on the table (so it doesn’t go back into the container), and return to their seat.
11. After all students have chosen a card, have the students who had a blue circle on their card stand up. Record this number on the board. Then have the students that had a green circle stand up. Record this number on the board.
12. Explain that the cards with a blue circle signify that the student died of smallpox. The students who chose a card with a green circle “survived” smallpox.
13. Inform the students that there were 100 cards in the container, with 90 blue circle cards and 10 green circle cards. What was the percentage of blue circle cards in the container? (90%) Show students how to determine percentage if needed. (Note to teacher: If you have more than one class, return all cards to the container at the end of each class so that each class has the same beginning mortality probability.)
14. Have students determine the mortality rate (in percentage) for the classroom simulation.
15. Have a class discussion about the results of the simulation. Who is left? How would this affect a tribe?
16. Have students continue the **Smallpox Worksheet** and discuss the questions in groups as they do the work sheet. When all groups are done, discuss the work sheet questions as a class. Each student is to turn in an individual work sheet at the end of class.

Science Grades 6-7 Smallpox Epidemic (continued)

Materials/Resources Needed

- 90 index cards with a blue circle drawn on each of them
- 10 index cards with a green circle drawn on each of them
- Work sheet : Smallpox Background and Effect on Native Americans
- Work sheet : Smallpox Work sheet
- World globe
- Container

Reference Web sites

- <http://science.nationalgeographic.com/science/enlarge/smallpox-virus.html>
- http://www.umass.edu/legal/derrico/amherst/lord_jeff.html
- <http://emergency.cdc.gov/agent/smallpox/overview/disease-facts.aspx><http://www.encyclopedia.com/topic/smallpox.aspx>

Extensions

What has happened to the smallpox virus?

How could smallpox be used as a bioterrorist weapon?

What steps has the United States taken to protect the population from a smallpox epidemic?

Why did the United States stop giving vaccines to the population in the 1980s?

“History Mystery” (<http://www.blm.gov/mt/st/en/prog/bcc/mystery.html>)

Smallpox Worksheet

Name _____

1. What is smallpox?
2. Why was smallpox so deadly to Native Americans?
3. Explain who Lord Jeffrey Amherst was. What was his role in the America's Revolution?
4. Explain Lord Amherst's perspectives regarding Native peoples.
5. Discuss and record your thoughts regarding the idea that Lord Amherst distributed smallpox infested blankets to Native people. Do you believe he did this? Why or why not?
6. What might have been Lord Amherst's motivation for doing what he did?
7. Are there documents that state Lord Amherst was responsible doing such a thing? Where are they located if they do exist? Does this alter your perspective regarding Lord Amherst's motives? Explain.

8. What was the mortality rate for the smallpox epidemic simulation in your class?
9. What would have happened to the survivors if all of the survivors were under the age of three?
10. What would have happened to the tribal members if all of the elders had died of smallpox?
11. How would you have felt if you were one of the survivors?
12. When the first astronauts came back from the moon, they were quarantined because of fears of possible viral or bacterial infection. It was found that the moon had no viruses or bacteria. Eventually, we will be sending astronauts to Mars. Should we isolate Mars' astronauts when they come back to Earth? Why or why not?